

Dieter's Top 13 Compounds

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Dieter's



Top 13

Compounds

Two major compounds:



Ionic



Covalent

What are compounds?



Two or more elements have

BONDED

“Blame those electrons again”

Ionic Compounds



- Metal plus Non-Metal

“transfer of electrons”

“metals donate”

Covalent Compounds



- Non-Metal plus Non-Metal

“they share electrons”

Dieter's



Top 13

Compounds



Remember...

SAFE EMERGENCY RESPONSE



BEGINS WITH ...



R RECOGNIZE

I IDENTIFY

C CHEMICAL

H HAZARDS



GASOLINE
JET FUEL
KEROSENE



GASOLINE



- Unleaded
- Oxygenated

GASOLINE



- Flash Point:
 - 43 to - 38 °C or - 45 to - 36 °F
- Autoignition Temperature:
 - 280 to 456 °C or 536 to 853 °F
- Flammable Limits:
 - Lower 1.2-1.4% and Upper 7.6%

JET FUEL

JP - 4



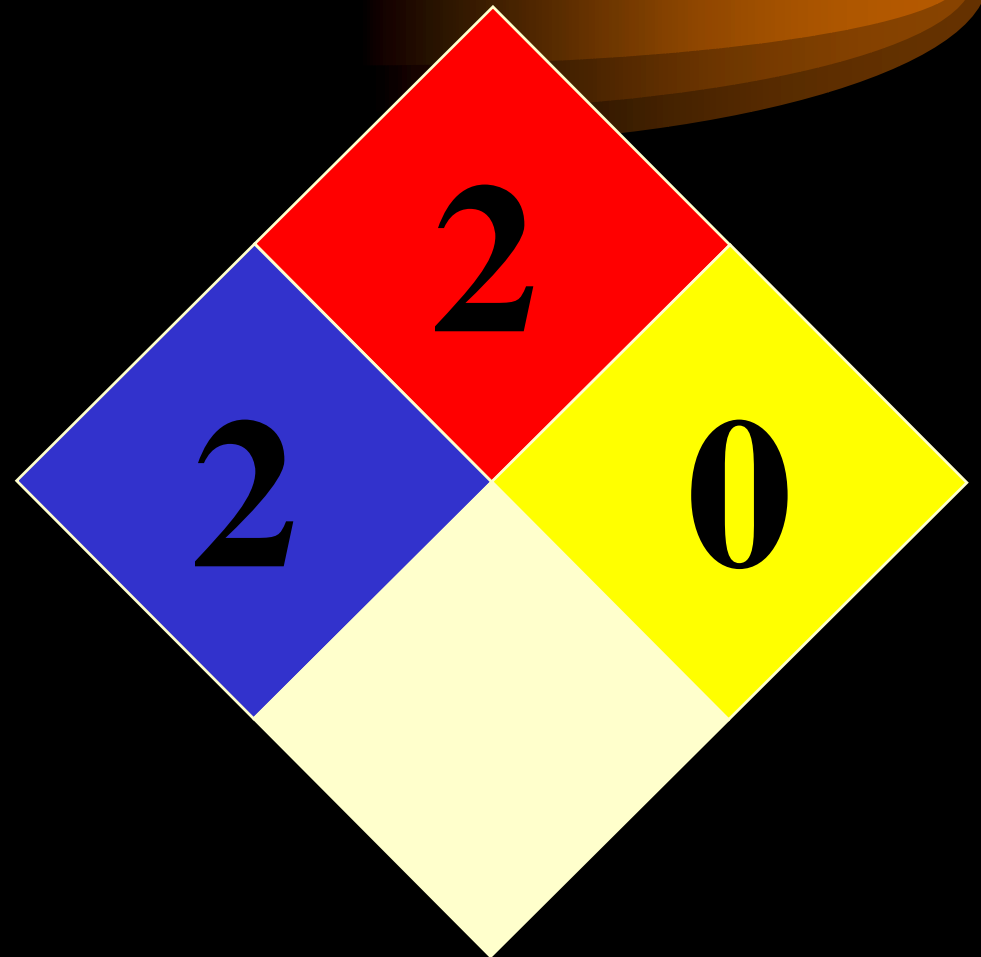
Flammability
Class OSHA IB

JET FUEL



- Flash Point:
 - 29°C or -20°F
- Autoignition Temperature:
 - 240°C or 464°F
- Flammable Limits:
 - Lower 1.3% and Upper 8.0%

KEROSENE



Jet Fuel A
Flammability
Class OSHA II

KEROSENE



- Flash Point:
 $>38^{\circ}\text{C}$ or 100°F
- Autoignition Temperature:
 210°C or 410°F
- Flammable Limits:
 Lower 0.7% and Upper 5.0%



SULFURIC ACID

“The life blood of
the Chemical Industry”



SULFURIC ACID



- Clear, colorless, odorless
- OILY LIQUID
- Corrosive to all body tissues!

SULFURIC ACID



A very great affinity for

WATER

“Air - Organic Matter - YOU!”



AMMONIA

“Mixtures of ammonia
and air will **EXPLODE**
when ignited under
favorable conditions!”



AMMONIA, ANHYDROUS



- Liquefied
- Compressed

“Pressure and expansion ratio”

AMMONIA, AQUEOUS




- “Gas in water”
- “Concentration!”

“From household to the industrial one”

AMMONIUM AZIDE



**“Shock, friction
and temperature
sensitive!”**

- 
- AMMONIUM DICHROMATE
 - AMMONIUM FLUORIDE
 - AMMONIUM HYDROGEN FLUORIDE

“From volcanoes to the really nasty ones”

AMMONIUM NITRATE



“Texas City **and**
ANFO”

AMMONIUM PERCHLORATE



“Henderson, Nevada”

AMMONIUM PICRATE

BOOM

BOOM

BOOM



HYDRAZINE

Anhydrous

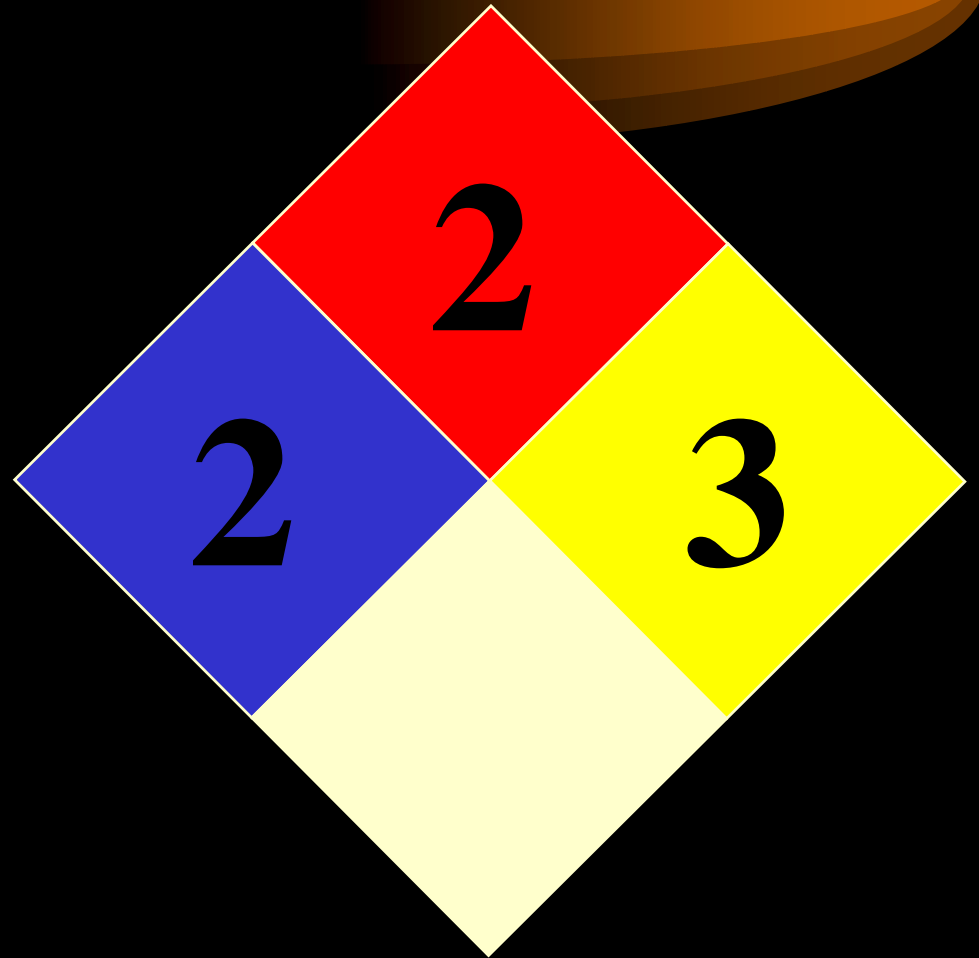
“Rocket fuel”



UREA NITRATE

WET

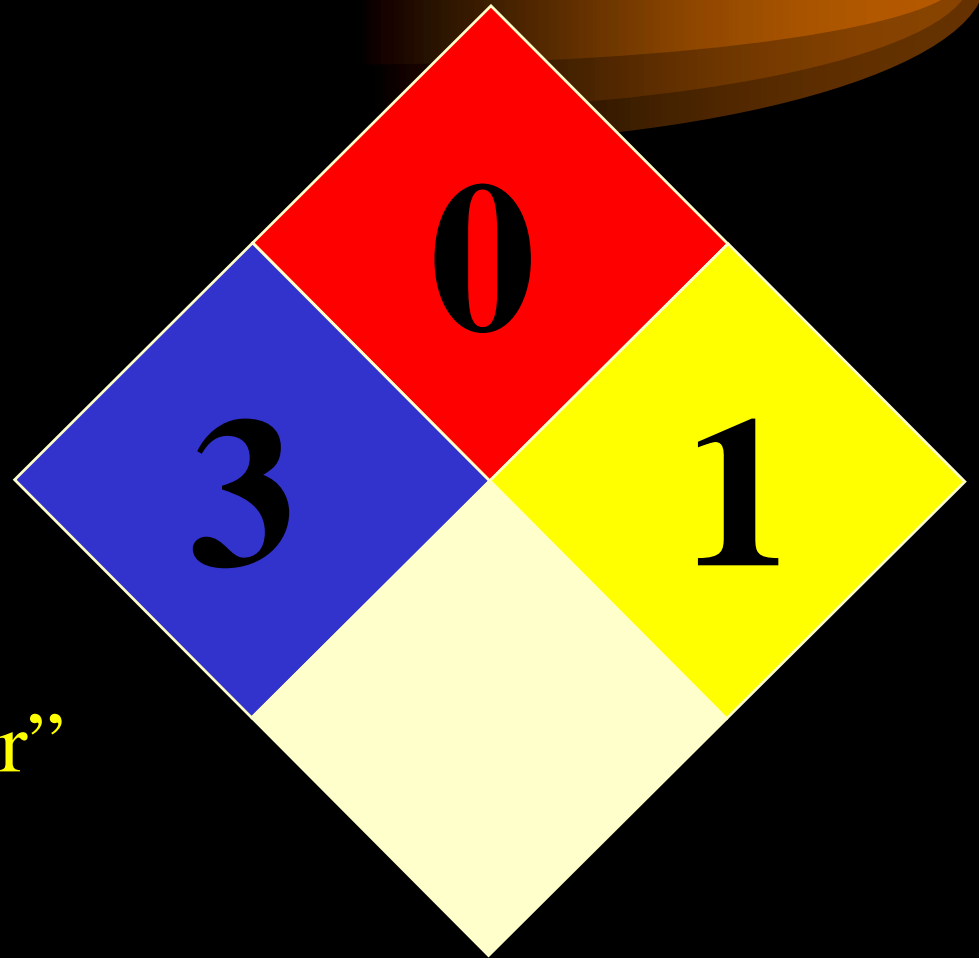
**“Fertilizer or
rocket fuel”**



#4

SODIUM HYDROXIDE

Dieter's "Silent Killer"



SODIUM HYDROXIDE



Also known as:

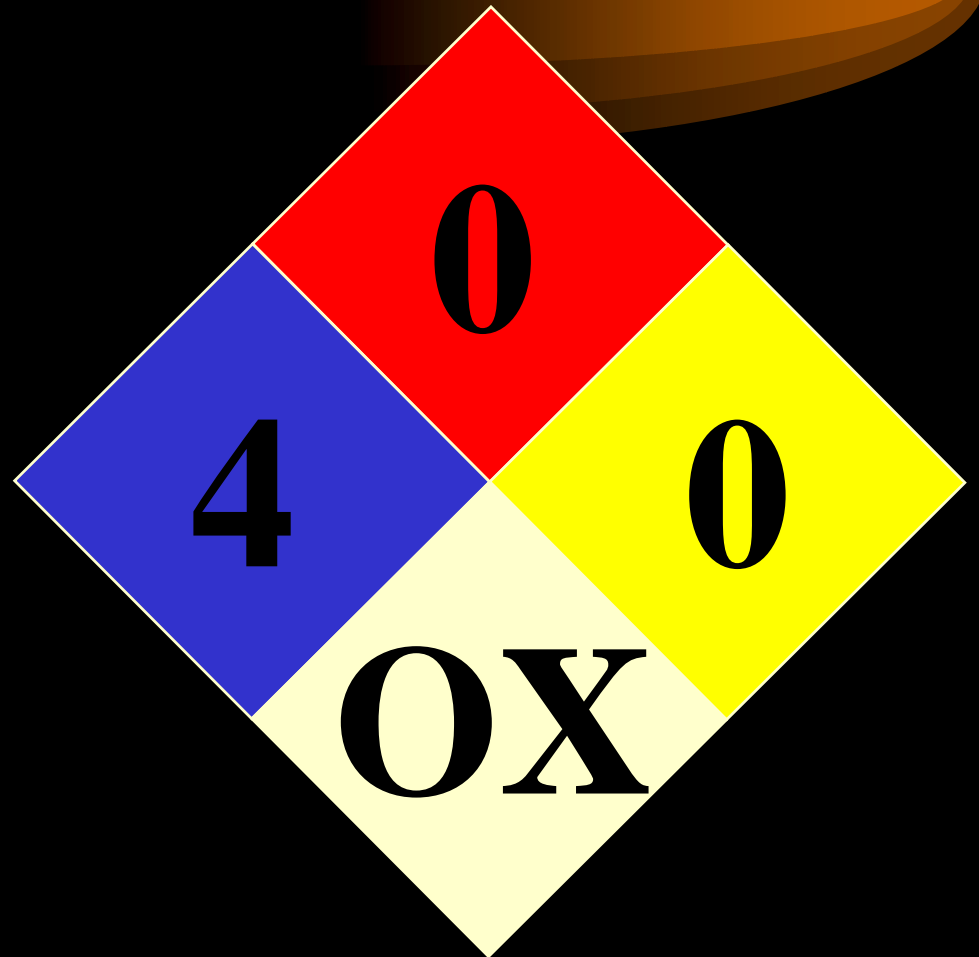
- Caustic Soda
- Soda Lye
- Sodium Hydrate

“Absolutely NO SKIN contact!”



CHLORINE

“The swimming
pool stuff”



CHLORINE



- Greenish-yellow, diatomic gas
- **Caution:** A powerful irritant can cause fatal pulmonary edema.

“Reacts with almost everything!”

#6

HYDROCHLORIC ACID



“Swimming pool acid”
“Toxic gas in water”



Hydrogen Chloride plus

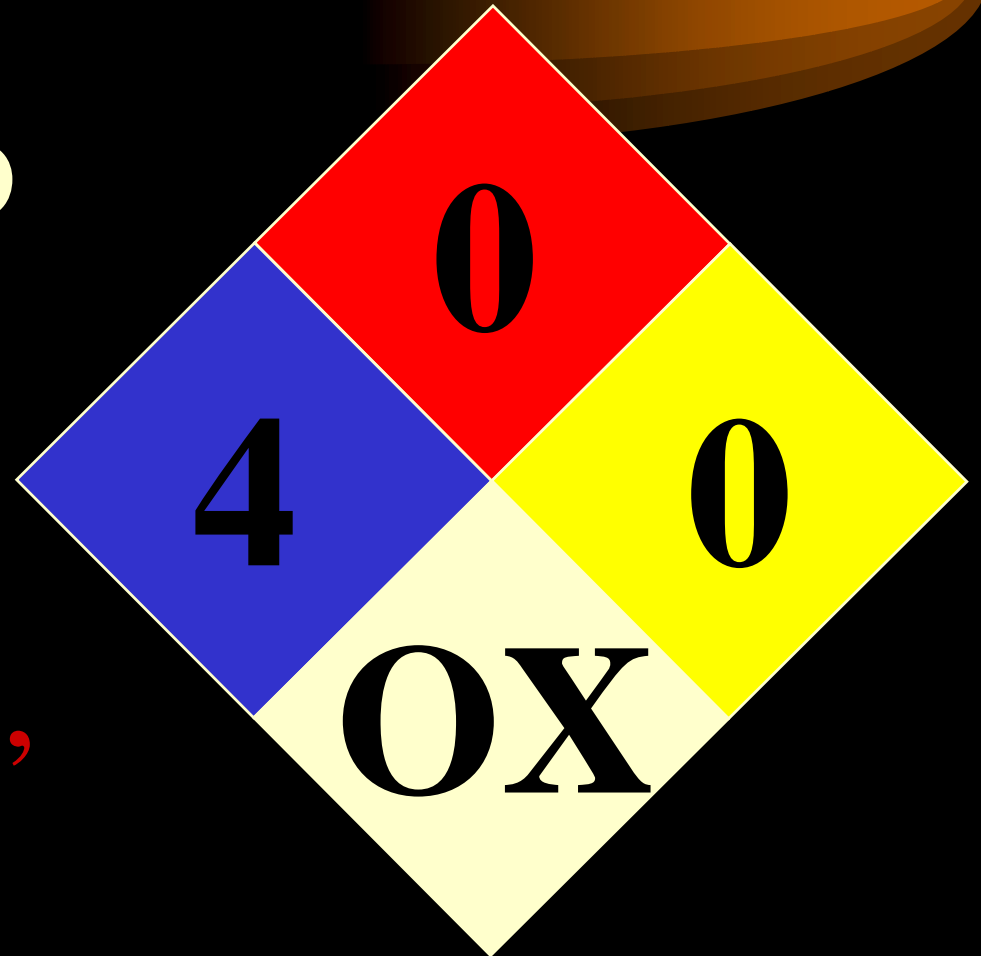
WATER

Concentration Effect!

“Muriatic Acid!”



NITRIC ACID



“Explosives”

NITRIC ACID



- Poison by inhalation
- Powerful oxidizer
- Corrosive

NITRIC ACID



- Nitric Acid in water
- Concentration 70-71%
- “Keep away from Copper”

NITRIC ACID, FUMING



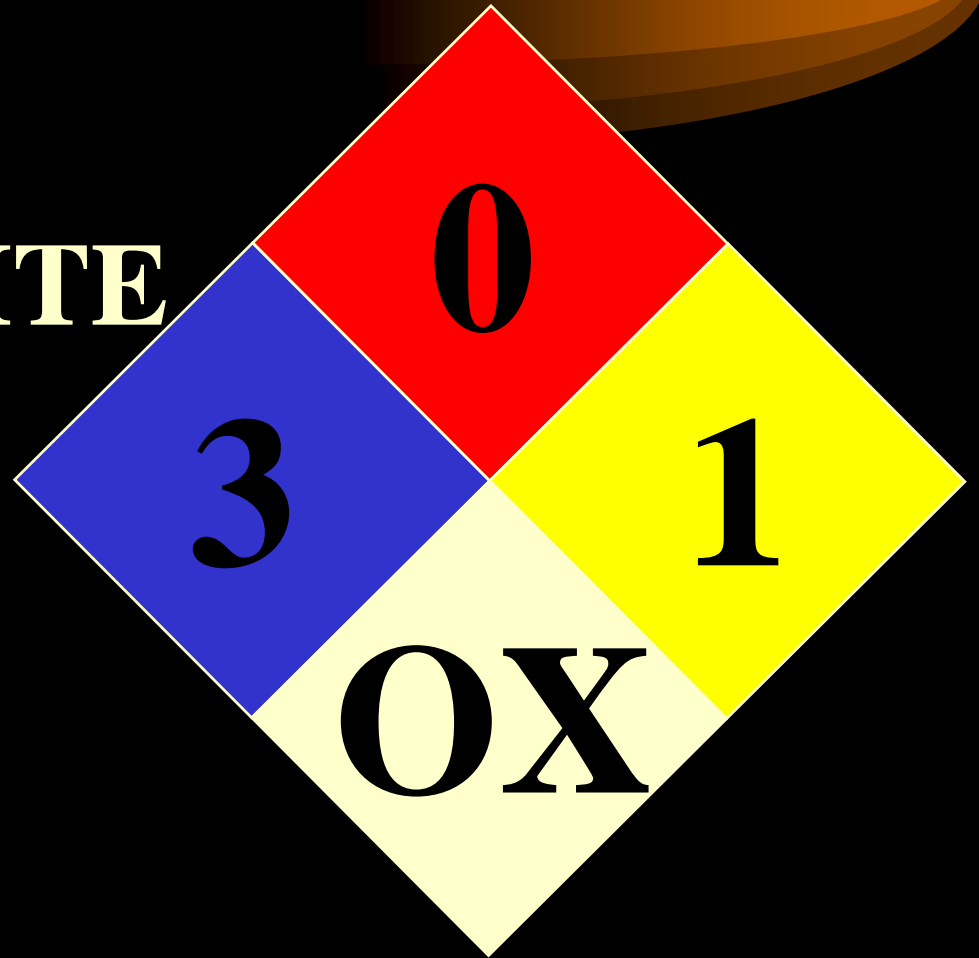
- Nitrogen Dioxide
- Nitrogen Tetroxide

“Denver, Blythe, Santa Barbara”

#8

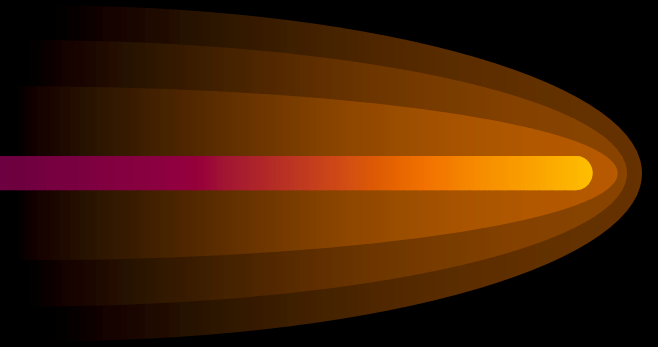
CALCIUM HYPOCHLORITE

“The dry
Chlorine”



Keep Oxidizers

Away from FUELS!



BOOM

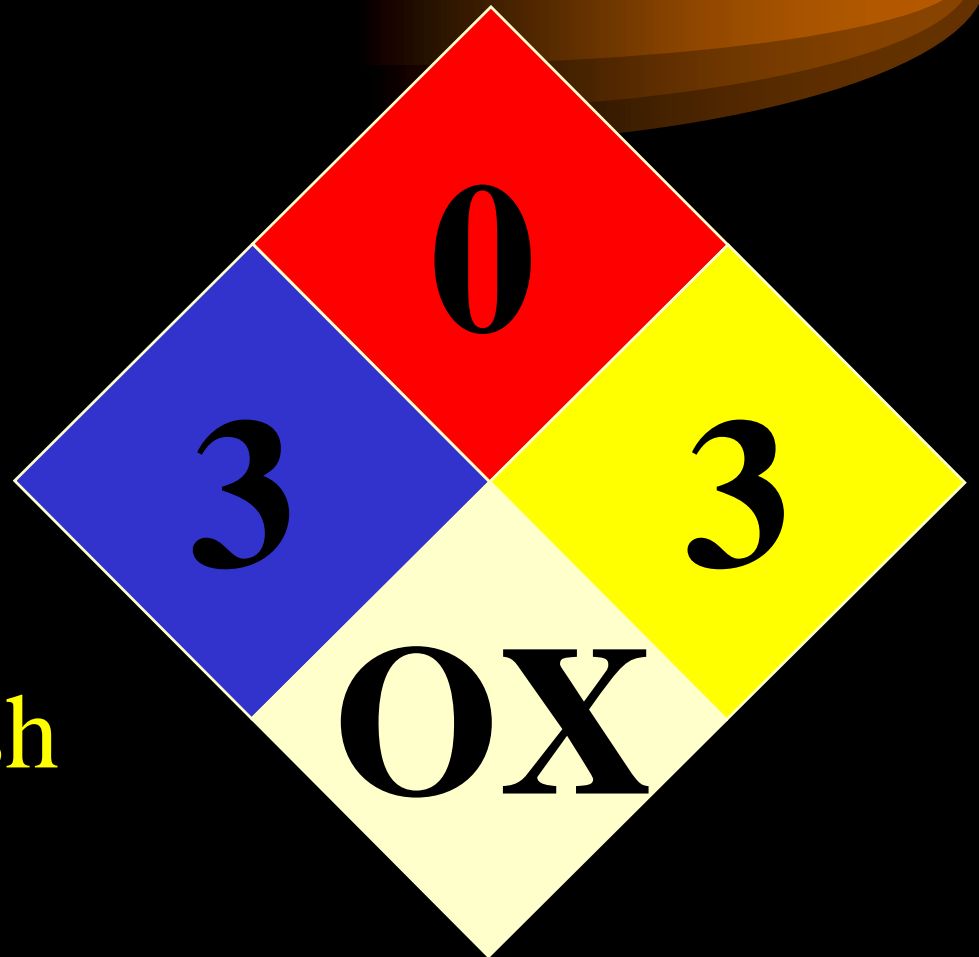
BOOM

BOOM

#9

HYDROGEN PEROXIDE

“From mouthwash
to rocket fuel”



HYDROGEN PEROXIDE



HIGH CONCENTRATIONS

MAY DECOMPOSE **EXPLOSIVELY**

WHEN HEATED ABOVE 141 °C

#10

PROPANE

“Let’s have a BBQ!”



PROPANE

- Gas
- Odorless
- Heavier than air
- BLEVE

PROPANE

- Sometimes mixed with
BUTANE

CAUTION: May be narcotic in high concentrations

#11

NITROGLYCERIN



“Colorless to yellow liquid”
“From cardiology to
explosives”

NITROGLYCERIN



CORROSIVE

May EXPLODE if exposed to shock, friction or heating.

#12

The Products of Combustion

“Color and Odor”



COMBUSTION




A chemical reaction between:

FUEL

and

OXIDIZER



“Often it is **NOT** fire, but the
toxic, corrosive fire gases that
KILL PEOPLE!”




“So, what is the **FUEL**?

And what is the **OXIDIZER??**”




Is the reaction **COMPLETE**
or **INCOMPLETE**?

“and how about the **speed**?”

- 
- CARBON DIOXIDE
 - CARBON MONOXIDE
 - CARBON

“Between a plain hydrocarbon and air!”

- 
- AMMONIA
 - HYDROGEN CYANIDE
 - HYDROGEN SULFIDE
 - HYDROGEN CHLORIDE



The Oxides of:

- SULFUR
- NITROGEN
- PHOSPHORUS

“With moisture from corrosive vapors!”

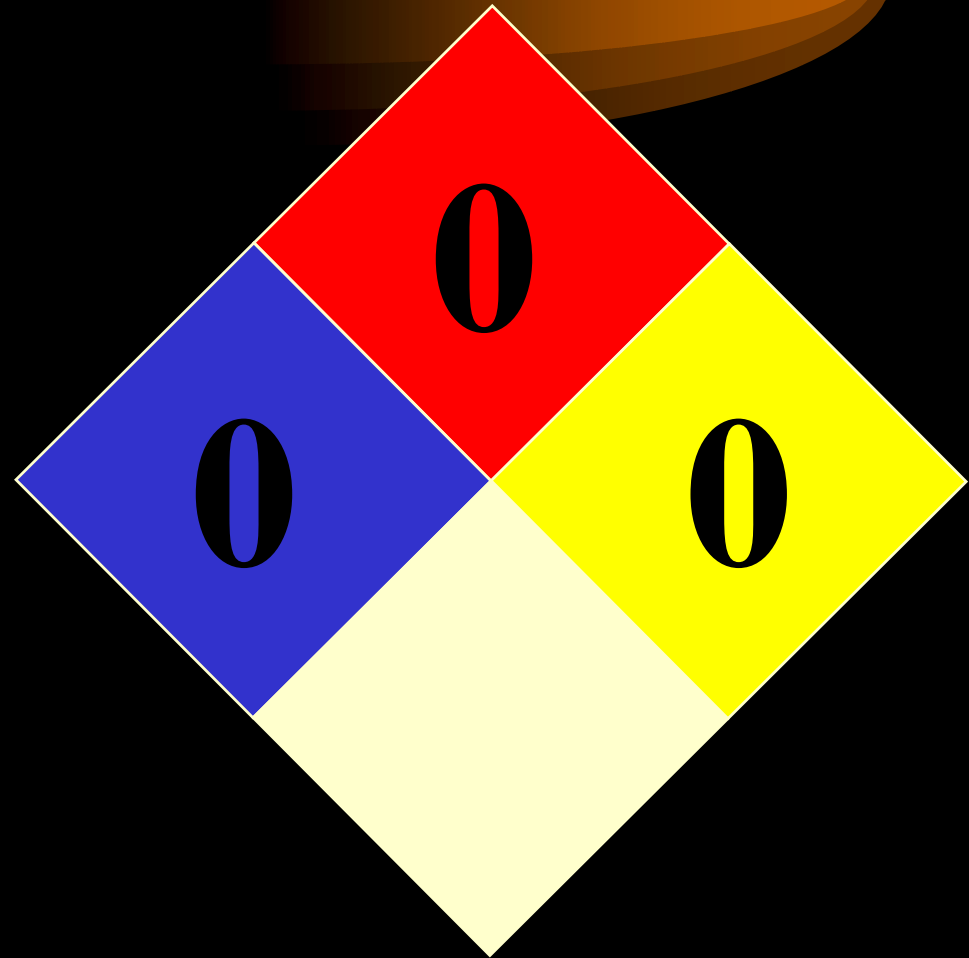


And, here comes #13...

#13

DIHYDROGEN MONOXIDE

“Including
Heineken and
Chivas Regal”





WATER

WATER

“The Universal Solvent”

WATER



But **WATER** is
a **CHEMICAL!**

“Two gases make a liquid”

WATER



- DROWNING
- ELECTROCUTION
- VIOLENT CHEMICAL REACTIVITY




Stay

RICH

FOREVER!

Thank you! Stay Alive!



It's a Great Day
for Chemistry!

